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ABSTRACT

The traditional systems used to produce goods and services in this country are being challenged by evolving alternatives. The focus of these new alternatives is on the human element in the work force. Studies in adult work attitudes indicate that a more humanistic system is needed to promote productivity. Inherent in the human condition is the need for some degree of control over the activities in which one engages. To meet this need, the new system of sociotechnical management allows workers to share in the control of their work activities and, in part, the destiny of their employing organization. This system was introduced in the Volvo plant in Sweden, where 15-20-member crews replaced the traditonal assembly line which had become outmoded as workers became more and more educated. Another example of humanizing formerly bureaucratic and autocratic management systems is seen in the Norwegian Merchant Marine, where very highly educated crews are needed to control the sophisticated equipment used on oil tankers. In the Merchant Marine, officers' special privileges have been lessened and more participation in management is being accepted by the crew. In recent months, General Motors has committed billions of dollars to redesign plants and involve employees in quality circles in an effort to increase productivity and reduce shoddy work. It is hoped that the industry of the future will become both more productive and more human through sociotechnical methods. (KC)

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ALTERNATIVE PHILOSOPHIES OF WORK:

IMPLICATIONS FOR VOCATIONAL EDUCATIONAL RESEARCH AND DEVELOPMENT

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FOREWORD

The traditional systems used to produce goods and services in this country are being challenged by evolving alternatives. The focus of these new alternatives is on the human element in the work force. Studies in adult work attitudes indicate that a more humanistic system is needed to promote productivity. Inherent to the human condition is the need for some degree of control over the activities in which one engages. To meet this need, the new system of sociotechnical management allows workers to share in the control of their work activities and, in part, the destiny of their employing organization.

Dr. Arthur G. Wirth has extensively studied the newly emerging sociotechnical theory of management both in the United States and other countries. Dr. Wirth is a professor of history and philosophy of education at the Washington University Graduate Institute of Education in St. Louis, Missouri. He has studied management redesign projects in the United States and in countries such as Norway, Sweden, and Denmark where new management systems have been developed. He has published widely and given numerous reports of his research on work, work settings, and alternative philosophies of work. He has served as a member of the Executive Board of the John Dewey Society.

On behalf of the National Center for Research in Vocational Education and The Ohio State University, it is a great pleasure to share the presentation by Dr. Arthur G. Wirth entitled, "Alternative Philosophies of Work: Implications for Vocational Education Research and Development."

Robert E. Taylor
Executive Director
The National Center for Research
in Vocational Education

ALTERNATIVE PHILOSOPHIES OF WORK: IMPLICATIONS FOR VOCATIONAL EDUCATIONAL RESEARCH AND DEVELOPMENT

The purpose of this paper is to call attention to the nature of the sociotechnical work design theory, a theory that is emerging as an alternative to the dominant scientific management (Taylorism) or "systems efficiency" model. First, I would like to give the background on the emergence of the rationale for this theory in the late sixties and the seventies by people loosely associated with The Tavistock Institute in England and the Work Research Institutes in Norway and Sweden. Second, I would like to talk informally about a recent experience of mine with Dr. William Duffy, director of the Research and Development Division at General Motors, who pointed out that General Motors is making strong moves in the sociotechnical direction through its recent five-year plan for the eighties. Finally, I would like for us to explore some possible implications of this theory for vocational research and development.

The philosophical rationale of sociotechnical work design is being developed by theorist-practitioners such as Pehr Gyllenhammar of Volvo in Sweden; Einar Thorsrud and Philip Herbst of the Oslo Work Research Institute in Norway; and by Michael Maccoby of Harvard in the United States.

In Scandinavia, the motivation for creating a new philosophy of work was the breakdown in the sixties of the Scandinavian version of the Methods Time Management model—a model that had been imported from the United States. A young, highly educated Scandinavian work force was responding to this classical engineering model with absenteeism, sloppy work, alcoholism, and malicious mischief.

A basic insight of sociotechnical theory is indicated by the term itself. It holds that the fundamental flaw of technical efficiency models is that they insist on seeking purely technical solutions to systems that are, in fact, sociotechnical.[1] "Socio" refers to the human part. The technical efficiency models are out of touch with the personal, subjective, and creative aspects of human reality.

To Pehr Gyllenhammar's credit, he saw that the mechanistic United States management model was harming productivity in Sweden because it was leading to irrational decisions in the name of rationality. In *People at Work,*[2] Gyllenhammar describes the factors that led to Sweden's far-reaching redesign of the concept of work.

In 1969, worker unrest spurred major organizational changes. Volvo had begun automobile construction in 1927 when it shared the assumption of the time that Taylorist efficiency principles were the means to successful competition. Management was tightly centralized, controlled by the company president, a three-man executive committee, and a large, hierarchically organized administrative staff. Its production system was technically oriented and planned in detail, using the American system of Methods Time Management. By the end of the sixties, however, this orderly

system was coming unstuck. The new element was a change in the nature and attitudes of young men and women entering the work force.

In Gyllenhammar's words:

> Like other good things, economy of scale turned out to have subtle limits. We begin to find today the symptoms of a new type of industrial illness. We invent machines to eliminate some of the physical stress of work, and then find psychological stress causing even more health and behavior problems. People don't want to be subservient to machines and systems. They react to inhuman working conditions in very human ways: by job-hopping, absenteeism, apathetic attitudes, antagonism. . . . The younger the worker is, the stronger his or her reactions are likely to be. People entering the workforce today have received more education than ever before in history. We have educated them to regard themselves as mature adults, capable of making their own choices. Then we offer them virtually no choice in our overorganized industrial units. For eight hours a day they are regarded as children, ciphers, or potential problems and managed and controlled accordingly.[3]

Volvo planners began to see that major problems were coming from the more highly educated young workers. They began to consider the idea of retaining the old rules and hiring less educated Finnish and Turkish workers. The logic of staying with what was purported to be a *rational* organization of work was leading them to reject the most highly educated youth their country had ever produced—and it probably would invite social unrest. A second possibility would be to engage in a bold critique of the hierarchical industrial tradition. The opening sentence in *People at Work* sets the tone of the alternative: "People, not machines, are the real basis for the spectacular growth of industry during the twentieth century."[4]

Behind this statement is the recognition that in advanced stages of technology, education is the invisible asset for new approaches to economic and social development. By the early eighties, 90 percent of Sweden's young people will be high school graduates and 70 percent will continue into higher education. In Gyllenhammar's words, "Among these increasingly well-educated people Volvo will have to find its future work force."[5] A democratic society invests heavily in education to produce people who regard themselves as mature adults, capable of taking the initiative and making intelligent choices. To neglect these new expectations and capacities is to invite trouble. To accept them as assets to be nurtured forces one into paths beyond the framework of traditional economic thinking. The basic switch in attitudes is away from viewing employees as "hired hands" to seeing and treating them as adult persons.

Puzzling new questions have to be faced if old habits of management are questioned: What kind of thinking do you use if you view workers as persons who want a chance to live and learn as mature adults in the work place? Is the production process a given to which humans must adjust, or can technology be redesigned to place it under the control of workers' intelligence and initiative? How do we balance the needs of workers, stockholders, customers, and the general public?

The answer to these questions is dependent on one's conception of the basic goal of economic enterprise. The president of Volvo frames his answer as follows: "The purpose of business is to help achieve and maintain the public good, and to create economic growth, taking into consideration all the interest groups involved with the company. This includes the demand to provide meaningful employment."[6] The goal is to view every worker as being entitled to a dignified work place, to an opportunity for personal development, and to a chance to influence work commensurate with each

worker's abilities--all with the enterprise still "staying in the black." The Volvo plant of Kalmar was, of course, a pioneer. Kalmar was in trouble. Wildcat strikes were erupting, employee turnover was 52 percent, and absenteeism was increasing. Volvo leaders finally decided that the old technical solutions were part of the problem.

Instead of more time and motion studies and increased supervision, the decision was made to create a work process that would increase worker autonomy and collegial collaboration. The alternative to the long, straight, and traditional assembly lines was to construct an atmosphere of small workshops, healthful and aesthetic, in the larger plant. A key change in thinking was that technology could be created to give people the flexibility to reorganize themselves at work. Instead of attaching workers to a moving line, materials were to be brought to work stations where autonomous groups of fifteen to twenty persons could do their own organizing. The heart of the Kalmar technology became moveable carriers, low self-propelling platforms, subject to a variety of controls by workers, on which assembly could take place. Work teams could design their own work and rest rhythms, job rotation, collaborative plans for trouble shooting, and could take responsibility for quality control.

In Gyllenhammar's words regarding the new concept: "Technology can strangle people. On the other hand, if it is designed for people, technology can also be a liberator—it is possible to devise new solutions to combine rational technological systems with greater freedom for human choice."[7]

Clarification of the possibilities of a different future for the work place environment has been carried forward over the past several decades in the Industrial Democracy Project and the Work Research Institutes in Oslo, Norway.[8] In Norway in the early sixties there was an awareness that the introduction of scientific management after World War II had strengthened industry's influence, but there was an unusual agreement among both employer and union organizations that it was showing its limitations in restricting cherished Norwegian qualities such as individualism, freedom, creativity, and social life in the work place. During 1961-1962 the Trade Union Council and the National Confederation of Employers set up a joint committee to study problems of industrial democracy. From that emerged joint action-research programs involving redesigns of work in industries, shipping, and, more recently, in education. After years of effort, the investigators have decided that the heart of the matter is concerned with the hierarchically organized bureaucracy itself.

They moved to the position that while classic bureaucratic forms historically emerge to fill real needs, they become increasingly dysfunctional in societies with democratic traditions and with secondary, higher, and continuing education available to citizens at large.[9]

According to the theory generated in the Industrial Democracy Project, the new concern for the quality of life is not merely an aberrant wish of impractical humanitarians. It is rooted in fundamental changes in individuals' relationship to their environment. The bureaucratic model worked when individuals' fundamental relation to their world was the physical environment. The environment could be conceptualized as an aggregate or cluster of elements that could be manipulated for human gain. Classical science built its theories of universal, deterministic laws on just such an aggregate model. Classical economic and management theory incorporated humans as constituent elements of the aggregate.[10]

The sociotechnical theorists maintain that we are entering a new stage: the stage of turbulent environments marked by rapid and drastic change.[11] "The source of the turbulent environment is man himself,"[12] and efforts to solve turbulent-type problems with procedures based on principles of the mechanistic, aggregate model increasingly break down.

The rate of change in technological design is increasing, so that "it has now become necessary to build learning capacities into the organization of industrial work teams. This can be achieved only by creating relatively autonomous matrix organizations in which neither task roles nor work relationships are fixed."[13] Within this framework, work teams of persons engaged in ongoing learning become capable of doing research both to find ways to improve production and to develop strategies for coping with changes in tasks. Linkages are established with universities and other research units.

The machine model is progressively replaced by developments toward:

> a society in which there will be relatively little difference in the educational level and status of those who work in industrial, educational, research, and service organizations. Persons will differ more as regards their focus of orientation than as regards the nature of their work. The leading elements in the transitional stage of development are the rapid increase and diffusion of complex technologies which can be operated by a small number of persons, and the rapid increase and diffusion of higher education. In terms of their operational requirements, these will up to a point be mutually supportive. As development continues, the traditional hierarchial type of organization based on the separation of doing, planning and deciding will be replaced by primary work groups in which these functions are integrated. The members of these groups will to an increasing degree be able to participate in policy decisions and be capable of using specialists as consultants.[14]

Sociotechnical designers also recognize that key problems concern not only *how* to produce but also *what* to produce. Adequate thinking about institutional planning and functioning requires a conscious incorporation of *ethical* goals and choices. In the technical-bureaucratic stage, thinking is limited more to how to get monetary results. As we become aware that we have control over the means and methods we apply, we are less able to shirk the assessment of the consequences of our choices. Gyllenhammar reports his thoughts, for example, on consequences of choosing alternatives to hierarchical bureaucratic control. He became aware, he says, that the most effective changes were those in which the workers themselves had the largest hand. He adds:

> It is almost alarming to realize how much know-how and capability had been locked up in the work force, unavailable to managers who simply didn't realize what an important resource it was. Our experience at Volvo has changed my views of management somewhat. Unlocking worker potential has become as important as any display of brilliance in technical terms.[15]

It is an existential choice whether to utilize or to ignore that potential.

A brief reference to another case may illustrate the ongoing, practical applications of the sociotechnical design philosophy. Last spring I interviewed at length a social science researcher who had been studying ten years of change in the Norwegian Merchant Marine on the ship Balao.[16] One of his discoveries was that the introduction of sophisticated computer technologies and other complex equipment is leading the Norwegians to challenge traditional military, hierarchical modes of organizing work on ships—especially on the enormously complex gas and oil tankers. A major need is to have a work force capable of confronting a myriad of problems resulting from the steady flow of new equipment and techniques. This order of change can be handled only by crews who are capable of ongoing learning, who develop multiple ratings, and who can troubleshoot collaboratively. Classical divisions between engine and deck crews, and even between officers and enlisted men, no longer make sense. For example, the old custom of assigning the swabbing of the engine room to a fifteen-year-old recruit is untenable because of the sensitive, complex equipment located there. Engine room cleaning now becomes a task for an autonomous work group of multiqualified personnel who collaboratively

study the problems at hand and develop their own work strategies. The move is toward autonomous, matrix work groups superseding traditional ship hierarchies. The Norwegians have begun to talk of small, "all officer" crews. A dramatic change in design of ship living quarters makes the point: the quarters of all crew members, including the captain, are now the same. Separate mess halls for officers have been eliminated.

In reflecting on features of sociotechnical work changes, Einar Thorsrud of the Oslo Work Research Institute has summarized some key ideas workers and management need if their goal is to create "good work" for themselves. They need to create the following:

1. Adequate elbow room. The sense that they are their own bosses and that they do not have some boss breathing down their necks. Not so much elbow room that they do not know what to do next.
2. Chances of learning on the job on a continuous basis. We accept that such learning is possible only when workers are able to set goals that are reasonable challenges for them and to get feedback of results in time to correct their behavior.
3. An optimal level of variety; i.e., they can vary the work so as to avoid boredom and fatigue and so as to gain the best advantages from settling into a satisfying rhythm of work.
4. Conditions where they can and do get help and respect from their work mates. Avoiding conditions where workers are pitted against each other so that "one worker's gain is another's loss."
5. A sense of one's own work meaningfully contributing to social welfare. That is, not something that could be done as well by a trained monkey or an industrial robot machine.
6. A desirable future. Quite simply, not a dead-end job; preferably one that will continue to allow personal growth.[17]

All participants in sociotechnical design agree that one of the most difficult challenges is to develop a style of leadership appropriate to work places where employees are to be treated as adults.

As Gyllenhammar puts it, participation does not mean permissiveness. Instead, it demands more self-discipline from everyone. Volvo now looks for managers with enough self-confidence to engage in real give-and-take situations, including those calling for the capacity to admit mistakes. Managers now need training to see themselves as information gatherers, as aides to workers, as teachers, and as consultants instead of bosses. They need to help people develop attitudes and skills in problem solving and self-discipline.[18]

A crucial point in developing leadership to produce "good work" (e.g., increased productivity) is to sharpen awareness of the difference between this goal and that of traditional job enrichment, which may include items such as flex time, and T group or sensitivity training for workers. The difference stems from the answer given to the underlying question of "What is the essential obligation of economic activity in a democratic society?" If it simply is to increase GNP, then we can view all items in the system in terms of their efficiency toward that end. Job enrichment is a means of manipulating the human variable (psychic dimension included) to increase productivity and other human resource outcomes (attendance, length of service, satisfaction).

A new perspective is introduced when we say that the purpose of economic activity is "to help achieve and maintain the public good." The sociotechnical design of work theory assumes that its approach will be effective with material productivity, but it does not accept the proposition that any technical or psychological change that increases productivity is sufficient evidence of "good work."

This point of view coincides with the premise stated by Kalman H. Silvert in *The Reason for Democracy:* "A democratic political economy must begin and end with the persons-in-society, seeing them as both end and means, and combining their reason and their actions in empowered participation."[19] Taken seriously, this requires, as Willard Wirtz has said, "A new economics which starts from a commitment to make the fullest practicable use of whatever talents are inside people instead of starting from a consideration of the most profitable use or misuse of the elements inside the thin and fragile crust of the planet. Such a policy would measure all major enterprises in terms of their comparative drain on dwindling natural resources and their comparative use of the highly developed—meaning educated—human resource." We might then, Wirtz suggests, start evaluating our economic activity in terms of its contribution to Net National Strength (NNS) rather than to Gross National Product (GNP).[20]

It is fair enough to say that all of this may sound interesting, but Scandinavia is not the United States, so what does it have to do with us? I want to report briefly on a day-long session on our campus with Dr. William Duffy, director of the Research and Development Division of General Motors. In the General Motors corner of the forest, sociotechnical work design is very much alive. The impetus for a shift in the sociotechnical direction is a familiar one for this organization: it is a sense of crisis, and a time of concern about the survival of the United States auto industry in the face of Japanese and German competition. Duffy said that until 1973, the American auto market was a relatively isolated situation where American companies could sell big cars, styling, and an obsolescence that led to turnover. The rest of the world needed fuel economy and quality of product.

With the oil embargo, American automakers found themselves thrown suddenly into the one-world market. General Motors, Dr. Duffy said, is now engaged in a desperate struggle for its existence. It is a moot point whether or not GM members of management can get their minds, attitudes, and procedures turned around in time. General Motors has now made a commitment to spend $43 billion in the next five years to rebuild plants and restructure its operation. To put it mildly, it is important that this $43 billion not be spent in the wrong way.

In their new plants, he said, they have four basic goals: (1) product quality better than that of the Japanese; (2) cost and waste controls (they can no longer afford recalls); (3) more efficient scheduling of parts and deliveries; and (4) a new kind of commitment on the part of the work force and management in order to achieve goals one through three. In the attempt to secure this commitment, General Motors has installed over one hundred Quality of Work Life (i.e., sociotechnical) projects in both old and new plants.

One essential question, Duffy said, is how to reduce the stress on managers. They are now convinced that a work model in which supervisors police reluctant workers who are producing shoddy products is not tenable for survival.

In terms of designing new plants, he said, "We concentrate now on planning interdependence between people and technology to meet a common goal." Three basic developments include the introduction of more industrial robots to handle the most unpleasant work, the use of computer technology to give immediate quality control feedback at the work site instead of quality control at

the end of the line, and the creation of autonomous segment assembly teams of fifteen to twenty workers who have more control over the work process—including the power to stop the line. The goal is to increase the self-esteem of assembly line workers. In turn, as these people take more responsibility, the tension on supervisors will be reduced.

In designing new plants, the general approach seems to be one modeled on the approach of the Harman International Industries plant at Bolivar, Tennessee—planned jointly by Sidney Harman and Irving Bluestone of the United Auto Workers Union, and Michael Maccoby of the Harvard Project on the Study of Work, Technology, and Character. A steering committee composed of top company executives and union representatives agrees on philosophical goals such as how to improve quality, minimize stress, and achieve better human values at work. A design team for implementing these goals includes both industrial engineers and social systems planners. Both groups have to agree on design plans for the actual facility. Core teams composed of supervisors and union representatives are responsible for obtaining ideas from the work site.

But making these changes is not a particularly easy process. Some workers and managers have trouble with the new changes. Ideas that are emerging include the following:

1. If the prime goal is to improve quality, management now feels that workers need to comprehend the total manufacturing process and the role of their production team in it. You cannot get good quality without this comprehension.
2. In the transition period, management needs systems flexible enough to accommodate people who do not want to change.
3. The trend is to select workers who like to collaborate, use tools, and learn new skills. In the new plants, prospective workers are told "Here we rotate, and learn new jobs. If you don't like that work style, don't hire in."
4. Even within a basic assembly line approach, some changes can be made; e.g., the most boring work can be automated and workers can rotate so that they get some bad jobs and some good jobs.
5. There can be some sharing of supervisory roles such as scheduling, quality control, and so forth.

Dr. Duffy acknowledged that there are varying opinions and divisions among General Motors' management regarding the changes, but he noted that executive promotions are tending to go to those who can think along sociotechnical lines. As to the question about whether the whole thing is another fad that will be gone in five years, he said, "No. It is a necessary adaptation for survival. We can't get a high quality product from a highly conflictive relationship with personnel."

Under the impact of a sense of shared crisis, he said, "Union leaders who have had justified skepticism about some quality of work life projects are beginning to change their attitudes." Within the last month, General Motors announced it was changing an historic policy by offering a profit-sharing plan to General Motors workers.

If this account about decisions at General Motors is accurate, we may assume that sociotechnical work design is going to be getting a kind of attention in the eighties that few would have predicted even several years ago. Hackman and Oldham in *Work Redesign*[21] tell us that the eighties will be a time when fundamental choices about work design will be made. The dominant scientific management tradition may very well grow in influence and refinements. Computer technologies are making

it possible to break work into steps more completely, to increase control over the time and movement of blue- and white-collar workers, and to beef up rewards for staying within the work parameters. The rewards of such progressive company reforms can be measured in increased worker productivity and satisfaction.

We must explore new directions consistent with the values and philosophy of sociotechnical theory. Such sociotechnical changes are a mark of a turbulent environment and era—the time of our lives. The process may not be easy, but it will not be dull.

NOTES

[1] P.G. Herbst, *Sociotechnical Design* (London: Tavistock Publications, 1974).

[2] Pehr G. Gyllenhammar, *People at Work* (Reading, MA: Addison-Wesley Publishing Company, 1977).

[3] Ibid, p. 4.

[4] Ibid, p. 2.

[5] Ibid, p. 21.

[6] Ibid, p. 29.

[7] Ibid, p. 68 and 159.

[8] See, for example, E. F. Emery and Einar Thorsrud, *Form and Content In Industrial Democracy: Some Experiences from Norway and Other European Countries* (London: Tavistock Publishing, Ltd., 1969), p. 9.

[9] P.G. Herbst, *Alternatives to Hierarchies* (Leiden, Netherlands: Martinus Nyhoff Social Science Division, 1976), p. 17.

[10] P.G. Herbst, *Sociotechnical Design* (London: Tavistock Publications, Ltd., 1974), p. 205.

[11] Ibid, p. 204.

[12] Ibid, p. 205.

[13] Ibid, p. 207.

[14] Ibid, p. 208.

[15] Pehr Gyllenhammar, *People at Work*, pp. 123-4.

[16] P.H. Herbst, *Sociotechnical Design*, p. 48.

[17] Fred Emery and Einar Thorsrud, *Democracy at Work* (Leiden, Netherlands: Martinus Nyhoff, 1976), p. 159.

[18] Pehr Gyllenhammar, *People at Work*, pp. 17-19.

[19] Kalman H. Silvert, *The Reason For Democracy* (New York: Viking Press, 1977), p. 117.

[20] Willard Wirtz, "Education for What," *Relating Work and Education* ed. Dyckman W. Vermilye (San Francisco: Jossey-Bass, 1977).

[21] J. Richard Hackman and Greg R. Oldham, *Work Redesign* (Reading, MA: Addison-Wesley Publishing Company, 1980), last chapter.

QUESTIONS AND ANSWERS

Question: Some people feel that the United States is becoming an information economy rather than an industrial economy. If this is true, then how are the American industries changing to meet the needs of our changing economy?

Although my field is philosophy of education, I have developed an interest in the area you have mentioned. The general point is that the amount of our economic effort now going into the production of hard goods is much smaller than it was a generation ago. We are definitely moving more toward the information economy or the electronic computer orientation. Yes, some American industries are making deliberate decisions in the design of their new plants to use both industrial robots and computer feedback systems that give them quality control at levels that they were not able to achieve previously. Companies are deliberately designing and using computer feedback so that more decisions based on that feedback can be made at the level of the work force. In the plants, several layers of management are being eliminated because the firms are moving toward getting more decisions made at the work site itself. This is just one example of where the new information systems can be combined with production processes in an attempt to get better quality.

Question: My concern is with what really happens to the worker. The bases of our economy are now in the automobile industry, and when that industry goes down, we have inflation. Therefore, if the information systems is going to use fewer workers, as we are told, then how is this going to help the workers?

I think that is one of the most difficult questions we have to face. When I talked with those people who were looking at the redesign of the Norwegian Merchant Marine, they talked about moving toward an all-officer crew because all crew members must learn much more than an ordinary sailor; therefore, they must be treated differently. But the point you are making is that they are certainly using fewer people, even on those giant oilers, so that at one level the work is more demanding, interesting, and challenging for that group of workers, but on another level, what has happened to people who used to swab the decks? I can guess as to the answer. There will be enough expansion of new industries to absorb them. It is a pretty good guess. We are being torn apart in this society by large numbers of people who are not "in the society." People are only "in the society," in one sense, if they can be at work. Those who do not work are not considered productive members of society. The result is that we have minorities, older people, handicapped individuals, women, and others who are not playing a role in our economy. Michael Harrington, author of *Decade of Decision* (Simon and Schuster, 1981), argues that we are going to have to think about possibilities we have not considered before; namely, moving in the direction of more labor-intensive work, along with the concepts I have mentioned.

Question: Are you saying that there will be more educated people, as well as more people out of work?

We do know that we have serious problems with unemployment, not only in our country, but in the rest of the world in general. We know that the people who are less educated have less of a chance of finding jobs. At the same time, there are more and more educated people who are having problems finding jobs that meet their level of expectation, and we have shortages of qualified people in some areas due to technological changes.

Question: What is the evidence that these new strategies of work redesign can help in terms of increasing productivity and employee satisfaction?

Some of these new strategies do not work due to the time it takes to put them in place. Some have worked well, some have mixed results, and some are having good results. There are studies that show some of the results. In the main, they seem to be tipped toward better results of various kinds. One thing that I was impressed by, is that General Motors is looking at work redesign very seriously. They are aware that the idea is not problem free, but they are feeling the need to move in this direction. One of the most helpful studies is Hackman and Oldham's *Work Redesign.*

Question: Did the impetus for trying this new theory come from the failure of traditional methods? The implementation of such strategies seems to "debureaucratize" the bureaucracy. What has happened to the organizations in Norway? Have they changed or do the workers view the organizations differently?

Well, to take the second part first, this is not an either/or situation. Many organizations can use these new work strategies while others must maintain traditional models. Some can utilize both types of strategies in different components of the same organization. We now have a different kind of work force to relate to. There are certain kinds of things that can be handled by these work teams. We also know from our own experience some of the situations that will or will not work. Now, the second part of your question is how to implement these strategies. One characteristic that I liked about the Norwegian models, which differs from our style, is that they made changes in the work organization in one ship over a ten-year span. They realized that it is not easy to change the customs, habits, and attitudes that have centuries of traditions behind them. We cannot do it overnight. We have to make changes that we think we can accommodate, learn from those changes, and make further changes. In order to implement these strategies successfully, there must be a clear commitment from top management and labor unions. Middle management is going to be threatened, and they are going to feel vulnerable unless they have confidence that they have support from the top for new kinds of moves. They are paying serious attention to philosophical values, and then they bring in consultants who conjure up models that would be consistent with the new direction that they think they ought to go in. After implementing the strategy, top management tries to get feedback from the work site as to the effectiveness of the model. I saw this model at an automobile mirror plant in Bolivar, Tennessee. The people working there were from the rural areas and had their own little farms on the side. I talked with one woman who had spent fifteen years on the assembly line. This is not a pleasant factory. It was hot, noisy, and had a lot of fumes in the air. They asked the workers if they wanted to change work models, and many of them said "no." They just wanted to come there and work. The ones who did say that they wanted to change said they wanted to get out of there so they could go home and fish or work on their farms. Management seriously considered these factors. They decided that when certain people finish early they could go over and help others. One woman, who had worked there for fifteen years, was really sold on things being better now. She

said, "Now when we have problems on the line, the people who know the answers are right on the line. Before, they used to bring in an industrial engineer from Philadelphia to evaluate the situation. All of the workers would just quietly stand around and let these engineers figure out remedies. Now they ask the workers. The workers can tell them in a hurry."

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